

### Abstract

An electro-desorption actuator comprises a fixed member, a movable member which is coupled to the fixed member, a pressure chamber which is disposed between the fixed member and the movable member, and a sorption compression system which is in communication with the pressure chamber. The sorption compression system comprises first and second electrical conductors, a sorbent which is positioned between the first and second conductors, a sorbate which is capable of combining with the sorbent in an adsorption reaction to form a sorbate/sorbent compound, and a power supply which is connected to the conductors and which is selectively actuated to generate a current that is conducted through the sorbate/sorbent compound to desorb the sorbate from the sorbent in a desorption reaction. The sorbate is communicated from the sorption compression system to the pressure chamber during the desorption reaction and from the pressure chamber back to the sorption compression system during the adsorption reaction. Thus, during the desorption reaction a relatively high pressure is created in the pressure chamber which will displace the movable member in one direction, and during the adsorption reaction a relatively low pressure is created in the pressure chamber which will displace the movable member in the opposite direction.

20